

Installation Instructions

Low Ambient Control

Foundation™ Packaged Rooftop Units 15 to 25 Tons

Model Number:
BAYLOAM305*

Used With:
15 to 25 tons Foundation™ unit with Symbio™ controls

SAFETY WARNING

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

- ⚠ WARNING** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
- ⚠ CAUTION** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.
- NOTICE** Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in **NEC** and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING

Follow EHS Policies!

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

⚠ WARNING

R-454B Flammable A2L Refrigerant!

Failure to use proper equipment or components as described below could result in equipment failure, and possibly fire, which could result in death, serious injury, or equipment damage.

The equipment described in this manual uses R-454B refrigerant which is flammable (A2L). Use ONLY R-454B rated service equipment and components. For specific handling concerns with R-454B, contact your local representative.

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General Information

This instruction covers installation of the low ambient kit on Foundation units with 3 phase condenser fan motor(s).

- Carefully review installation instructions.
- This instruction covers installation of the low ambient kit on Foundation units with 3 phase condenser fan motor(s).

Inspection

1. Unpack all components of the kit.
2. Check carefully for shipping damage. If any damage is found, report it immediately, and file a claim against the transportation company.

Parts List

Table 1. Parts list

Qty	Description
1	Low ambient control module
2	8-32 x 1 in. Screws
2	10-16 x 0.5 in. Screws
1	Temperature sensor
1	Pressure transducer
1	Pressure tap tee
1	Rubber grommet
1	Outdoor motor power harness
1	Control power harness
1	Temperature sensor harness
1	Temperature sensor extension harness
1	Schematic
1	Installation Instructions
1	Installed accessory label

Installation

General Information

Table 1. Low ambient controller ratings

Volts, AC	208, 240, 380, 415, 480, 600
Control Voltage	18–30 Vac
Frequency	50–60 Hz
Operating Temperature	-40°F to +140°F (-40°C to 60°C)
Full Load Amps	10 Amps
Transducer Pressure Control Range	0–500 psi

Controller

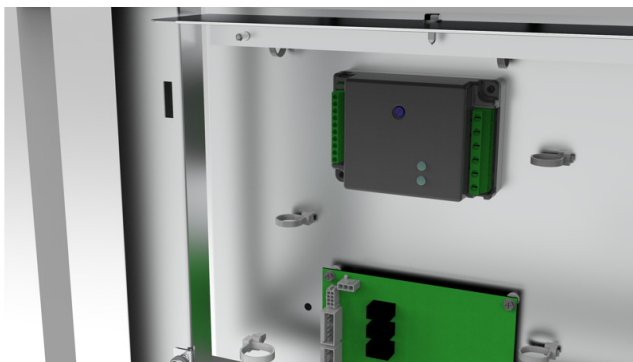
⚠ WARNING

Hazardous Voltage w/Capacitors!

Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury. Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power cannot be inadvertently energized. Verify with a CAT III or IV voltmeter rated per NFPA 70E that all capacitors have discharged.

1. Disconnect all power from the unit.
2. Remove the compressor and control box access panel(s).
3. Use eight 32 x 1-inch screws to mount the controller bracket. See [Figure 1, p. 5](#) for orientation.

Figure 1. Mounting location



4. Open the left-side, low voltage door to access the high voltage section. This is where the controller will be mounted. See [Figure 1, p. 5](#) for mounting location.
5. Use 10-16 x 0.5-inch screws to mount the assembly to the control box back panel.

Note: *The right side of the assembly will slide into the slot in the back panel. Secure the left side with screws (supplied in the kit).*

Pressure Transducer

1. Install the supplied tee on the high pressure service port. See [Figure 2, p. 5](#).
 - a. Remove cap nut from high pressure service port.
 - b. Install the pressure sensor on one of the tee ports. See [Figure 3, p. 5](#).
 - c. Place the tee flare nut with the valve core depressor on the high pressure tap. See [Figure 4, p. 6](#).
 - d. Tighten flare nut securely to the high pressure service port and check for leaks.
 - e. Place cap nut on open port tee.
 - f. Route wires along with existing sensor wires into main control box. Refer to wire harness installation section for proper wire routing path back to controller mounting location.
 - g. Connect wires to the appropriate controller terminals. See schematic.

Figure 2. High pressure service port

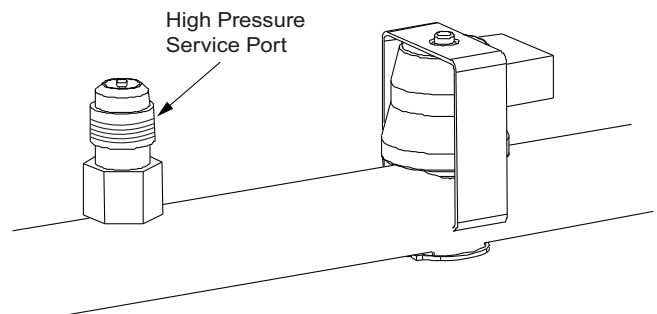
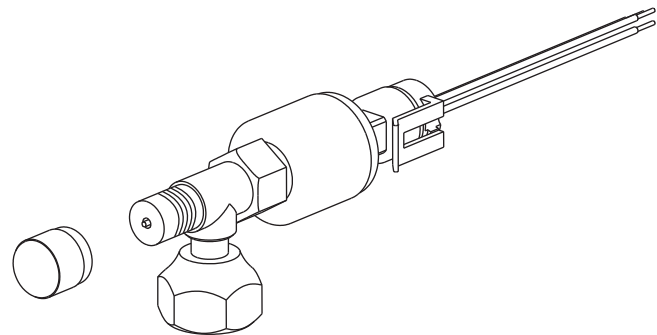
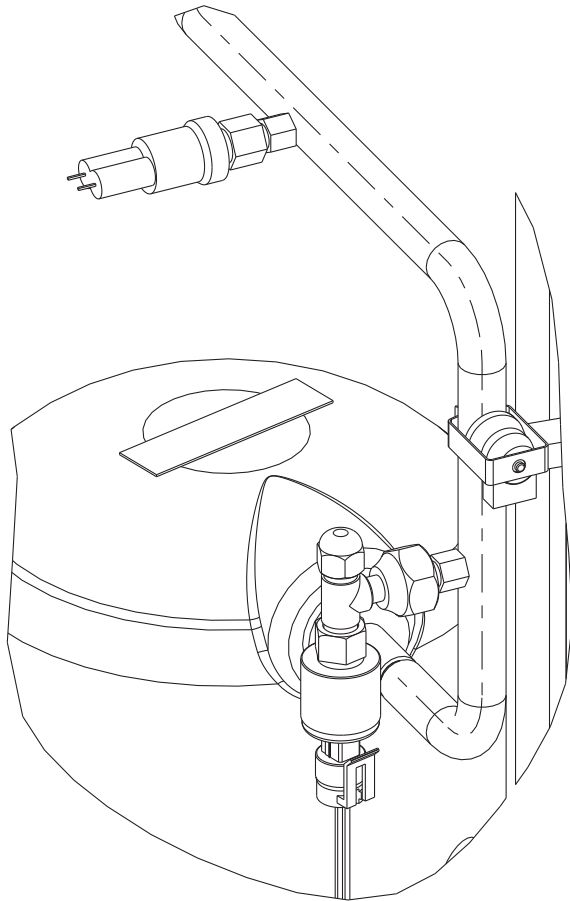


Figure 3. Transducer to tee



Installation

Figure 4. Tee and transducer installed on high pressure service port



Temperature Sensor Installation

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The existing thermistor, used by the unit controls, measures the outdoor ambient air temperature.

15 to 25 tons – existing thermistor is mounted in the lower, right corner of the main control box.

The low ambient controller requires a second thermistor. Both locations are factory designed with a second hole for the controller temperature sensor.

1. Install grommet in second hole located next to existing temperature.
2. Insert controller temperature sensor in grommet. Confirm majority of the sensor is pushed through the grommet.

Control Box Wiring

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1. Disconnect ODM1 from power circuit.
 - a. Unplug PPM79 (orange connector) from underneath control box.
 - b. Remove PPF79 from sheet metal opening in control box wrapper.

Figure 5. Panel mount connector location

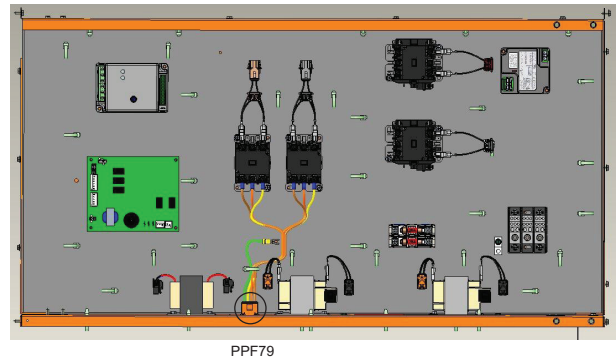
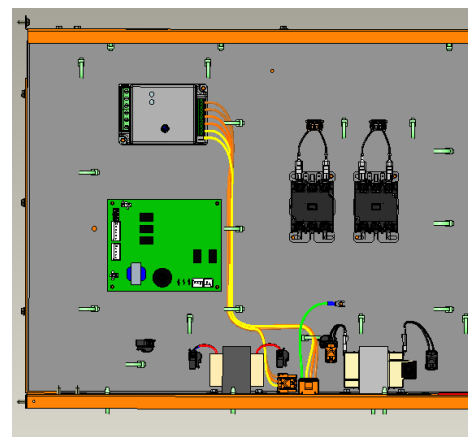
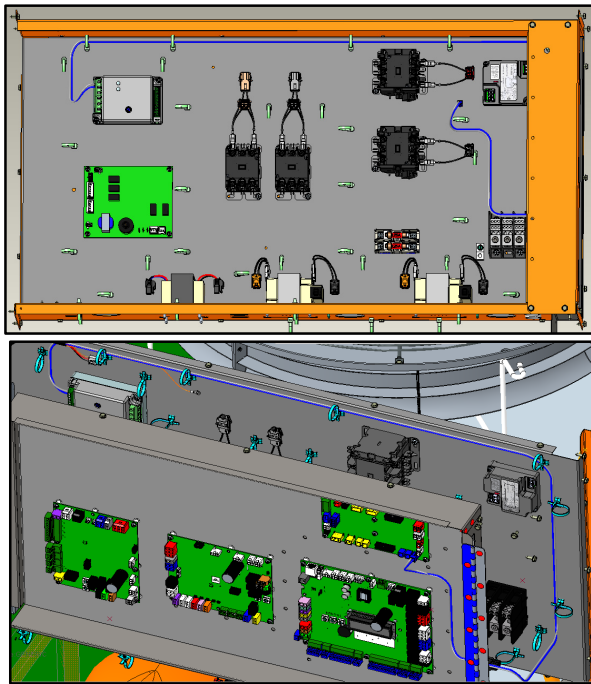


Figure 6. Outdoor motor power harness



2. Install outdoor motor harness in control box as shown in [Figure 6, p. 6](#).
 - a. Plug PPF79 from OFC1 into PPM79B of the power harness.
 - b. Snap PPF79B back into the control box wrapper where PPM79 was originally placed.
 - c. Refer to schematic for connection points and install remaining strip lead connections into controller.

Figure 7. Control power harness



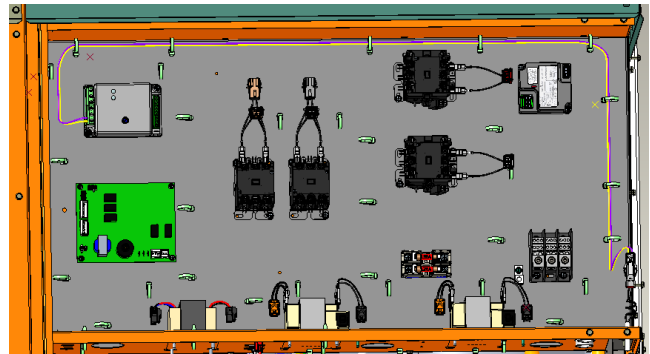
3. Install control power harness in control box as shown in [Figure 7, p. 7](#).
 - a. Refer to schematic and install wires to appropriate terminals on the controller.
 - b. Route harness across back panel and up onto right low voltage door to the adapter board.

Note: *Following existing wiring paths to adapter board but routing through horseshoe shaped opening on low voltage door.*
 - c. Connect P6 from control power harness to AB-J6. Refer to main unit schematic.
4. Temperature sensor harness
 - a. Install temperature sensor harness in control box as shown in [Figure 8, p. 7](#).
 - b. Refer to schematic and connect wires to appropriate terminals on the controller.
 - c. Route harness across back panel and into lower right corner.

15 to 25 tons – connect to sensor previously mounted in control box.
 - d. Connect harness to temperature sensor connector.

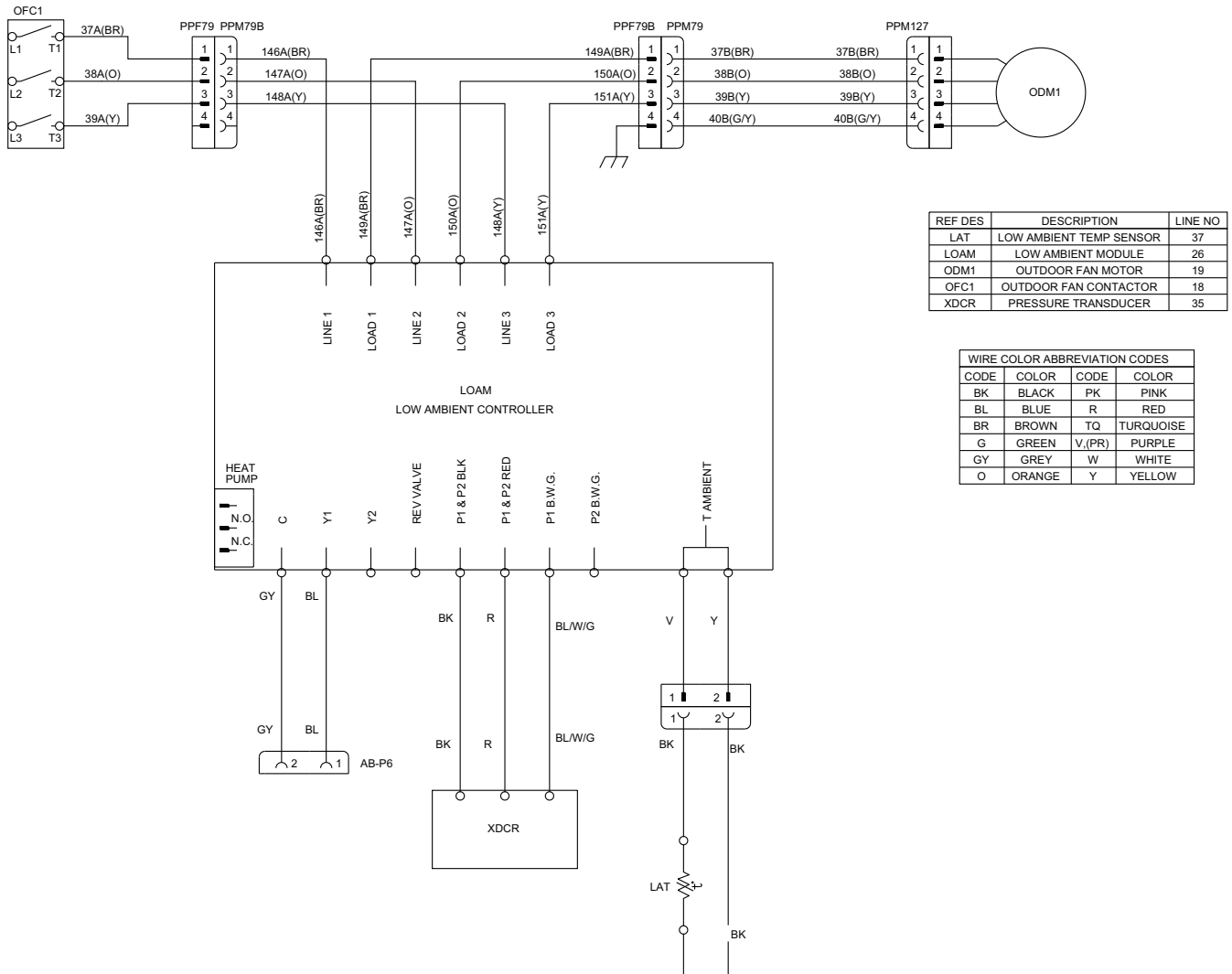
5. Final wiring
 - a. All harnesses in this kit can utilize the factory installed wire ties in all routing paths.
 - b. Secure installed wires with wire ties.

Figure 8. Temperature sensor harness



Installation

Figure 9. Low ambient controller

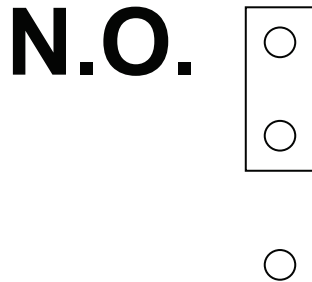


Controller Settings and Operation

Jumper Position

For non-heat pump applications, the heat pump select jumper must be in the default (N.O.) position, and the **REV. VALVE** terminal must not be connected.

Figure 10. Jumper position



Controller Operation

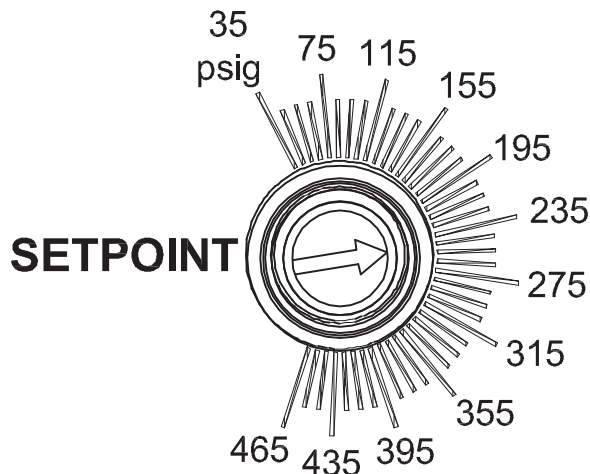
- The LOAM controller is used to maintain head pressure within an acceptable range when ambient temperature falls below 50°F. It reads discharge pressures from both refrigeration circuits.
- It cycles both outdoor fan motors on and off to maintain the highest of the two discharge pressures at the selected setpoint anytime one or more compressors are operating. Above 50°F, both fans will be energized continuously.

Pressure Setpoint

Set the pressure setpoint to the recommended value of 245 psig (see [Figure 11, p. 9](#)).

At ambient temperatures lower than 50°F, the controller will maintain the highest of the two circuits discharge pressures between 15 psig above and 15 psig below dialed pressure setpoint.

Figure 11. Pressure setpoint



Labels

Apply self-adhesive labels supplied with the kit to the inside of the panel covering the main control box:

1. Accessory label: Apply near the unit nameplate.
2. Supplementary wiring diagram label: Schematic can be placed in schematic pouch already located on back of right side low voltage door that contains all main unit schematics.

Close-Up, Fan Inspection, and Restart

1. Inspect condenser fans:
 - a. Manually rotate the condenser fans to ensure free movement and check motor bearings for wear.
 - b. Verify that all fan mounting hardware and fan hubs are tight.
2. Connect all power to the unit.

Troubleshooting

Confirm the unit is operating properly through the desired pressure range.

Table 2. Troubleshooting guide

Problem	Possible Cause	Possible Solution
No fan operation	No 24 volt control voltage	Check for 24 Vac at control and verify correct wiring. If wired correctly, check voltage across the transformer.
	No line voltage	Check voltage across the brown, orange, and yellow OD motor leads. If no line voltage is present, verify all wiring is correct.
Improper fan operation	Heat pump jumper not configured correctly	Refer to the IOM or correct hook-up diagram and verify the heat pump jumper is configured correctly.
	Control is not wired correctly	See wiring diagrams. Ensure that the 24 Vac power supply is connected in-phase with the motor power supply.
No fan modulation	No need to modulate the fan	If pressure is equal to or greater than the head pressure control setpoint, the fan will be operating at full speed.
	No input pressure to control	Check for proper transducer and Tee installation. Schrader valve depressor must depress Schrader valve enough to allow refrigerant into pressure transducer.
	Miswired	Check that the 24 Vac signal and the transducer are wired up correctly into the controller.
Erratic fan operation	Control is not wired correctly	See wiring diagrams.
	Pressure transducer problem	Check for proper transducer and Tee installation. Schrader valve depressor must depress Schrader valve enough to allow refrigerant into pressure transducer.
	Dirty or blocked condenser coil	Clean condenser coil.
Fan motor is cycling on thermal overload	Dirty or blocked condenser coil	Clean condenser coil.
Unit fails to start	Incorrect/No voltage present	Using an AC voltmeter, measure the voltage between the 24 Vac terminals. It should read approximately 24 volts. Measure line voltage between LINE1, LINE2, and LINE 3 to confirm that line voltage is present.
	Transducer malfunction or not installed	If lights are flashing alternatively, then no probe is connected or the probe is malfunctioning. When using a pressure transducer, with power applied to the control, use a voltmeter to measure volts DC between COMM and P1 or P2, where the wire is connected. The reading should be according to Table 3, p. 10 below.
The fuse is blown and/or signs of damage on the unit	Miswired	The unit has been mis-wired and may be permanently damaged

Table 3. Pressure vs. voltage

Pressure (psig)	Voltage (Vdc)
0	0.5
50	0.9
100	1.3
150	1.7
200	2.1
250	2.5
300	2.9
350	3.3
400	3.7
450	4.1
500	4.5

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